REMARKS

Claims 1-22 are pending in the present application. In the Office Action mailed April 7, 2005, the Examiner rejected claims 1-6, 9-11, 13-20, and 22 under 35 U.S.C. §103(a) as being unpatentable over Schneider et al. (USP 6,194,682), in view of Schutz (USP 5,912,471). Applicant appreciates indication of allowability of claims 7, 8, 12, and 21.

Claim 1 was rejected as part of a group rejection of claims 1-6, 9-11, 13-20, and 22 under 35 U.S.C. §103(a). The Examiner stated that "Schneider teaches a plasma torch system for cutting having a power source connected to a plasma torch and multiple feedback signals from the torch to the power source/controller." However, the Examiner did admit that "Schneider et al do[es] not show the claimed feedback path comprising a serialization circuit." Therefore, the Examiner cited Schutz as teaching "that it is conventional to use a serialization circuit, block 8, to communicate feedback signals from a torch 17, 2 to a controller 15 and use of the same provides accurate and efficient control." Applicant agrees that Schneider et al. does not teach or suggest a serialization circuit. However, Applicant does not believe that Schutz fills the gap in Schneider et al. Schutz merely teaches a thermal coating apparatus, not any welding-type apparatus, and teaches only communication between a serial port and an external computer, not between a plasma torch and a plasma cutting power source. *See* Abstract; col. 6, lns. 38-39.

Applicant is not claiming to have invented a serialization circuit, nor a serialization circuit communicating with a computer. Applicant is claiming a serialization circuit that communicates between a plasma torch and a plasma cutting power source, wherein the serialization circuit is disposed within the plasma torch. The prior art cited not only fails to teach serialization communication of multiple feedback signals between a plasma torch and a plasma cutting power source, it also fails to disclose, or even suggest, that the serialization circuit is within the plasma torch itself. Accordingly, for this reason alone, the §103 rejection is unsustainable, and Applicant respectfully requests withdrawal thereof.

Further, it is not obvious to combine a thermal coating apparatus (of Schutz) with a plasma cutter (of Schneider et al.). Each is a unique process and there is no suggestion in either reference how one can be used with the other. Plasma cutters are configured to generate and transfer an arc and a heated airflow or other plasma from a nozzle to a workpiece to cut the workpiece. Oppositely, a thermal coater is configured to deposit substances onto the surfaces of materials. A thermal coater adds material to a workpiece, whereas a plasma cutter reduces or cuts a workpiece. Thus, one of ordinary skill in the art of plasma cutting would not be motivated to look to the teachings of a thermal coating apparatus of Schutz.

The Examiner's proffered motivation for making such a combination is not supportable. The Examiner stated that it would "provid[e] more accurate, efficient, and faster communication between the torch and the remote controller". (Emphasis added.) Such a combination is unworkable. First, the system taught by Schutz requires two wires extending from the coating equipment to two different locations. A power cable would be needed to connect thermal coating apparatus 17 to a power source (not depicted) and a data cable (unnumbered) is used to connect block 8 of the monitoring apparatus 1 to the computer 15. *See* Figs. 1, 2; col. 6, lns. 38-40. Conversely, both Schneider et al and the present invention provide for more convenient arrangements of cables for power and feedback transfer in which both extend from a plasma torch to a power source. Thus, incorporating the system of Schutz into Schneider et al. would actually require an increase in separate parts (i.e. the computer and the monitoring apparatus) and require more complex wiring (i.e. wires extending between the computer and the monitoring apparatus and between the thermal coating apparatus and a power source). Such a combination would also result in a less convenient design, more complex set-up, and less efficient manufacture. In addition, the only feedback signals even contemplated by the system of Schneider et al. are voltage signals, current signals, or derivatives thereof. Col. 4, lns. 53-57. The Examiner has not identified how a serialization circuit would make transfer of these particular signals faster. It is noted that Schneider et al. merely states that such feedback "may be provided", but provides no teaching of how such signals would be communicated. Therefore, no suggestion or motivation exists to combine Schneider et al. with Schutz.

Apart from the lack of motivation to combine these references, even if a combination of Schneider et al. and Schutz were somehow made, claim 1 is still patentably distinct over the art of record since neither reference teaches or suggests the claimed configuration. Claim 1 calls for "transmission of multiple feedback signals between the plasma torch and the plasma cutting power source." Schutz specifically states that "data are transferred via the serial interface 26 to the computer 15." Col. 6, lns. 38-39. That is, serial interface 26 is connected to carry information from the circuitry block 8 of monitoring apparatus 1 to computer 15. *Id.* One of ordinary skill in the art will recognize that this, on its face, does not teach sending feedback signals between a plasma torch or a power source." (Emphasis added.) Further, there is no suggestion to place the serialization circuit in the plasma torch.

The Examiner stated "that means 2 in Schutz is attached directly to the torch body and is considered part of the torch body." However, thermal coating apparatus 17 is clearly not a plasma torch. Schutz refers to this device alternatively as a "thermal coating apparatus," a "plasma coating apparatus," a "plasma spraying apparatus," and a "coating jet," but never a

"plasma torch" or any kind of "torch" at all. Other than the use of the word "plasma", there is no commonality between these apparatus.

In addition, Schutz is clear that monitoring apparatus 1 is distinct from thermal coating apparatus 17. Schutz states that "[s]ince the general layout of a plasma coating apparatus and the mode of operation thereof is well known to every person skilled in the art, no detailed description thereof is required here." Col. 4, lns. 38-42. Schutz then proceeds to thoroughly describe monitoring apparatus 1. Also, monitoring apparatus 1 and thermal coating apparatus 17 are shown as physically separate bodies in Fig. 1. The rectangular block representing the housing of a thermal coating apparatus does not include or surround the monitoring apparatus. *See* Fig. 1. This block is not labeled, yet the solid line 2 around monitoring apparatus 1 is labeled, and described as a "housing". Col. 4, ln. 50. Thus, monitoring apparatus 1 is individually housed, and by the same drawing convention, it is apparent that thermal coating apparatus 17 is individually housed. Further, it is notable that Schutz does not claim a torch, a thermal coating apparatus, or a component thereof. Thus, the monitoring apparatus 1 is not part of the thermal coating apparatus 17, let alone part of a "torch body", and does not constitute the claimed "plasma torch" called for in claim 1.

In addition, Schutz does not mention a power source at all. Schutz is clear that serialized communication occurs only between the circuitry block 8 of monitoring apparatus 1 and a computer 15, not a power source. Col. 6, lns. 38-39. Therefore, Schutz does not teach either endpoint of the claimed transmission path called for in claim 1. Since the Examiner has admitted that Schneider et al. also does not teach each and every element of claim 1, and since it would not be obvious to combine Schutz and Schneider et al., Applicant respectfully requests that the rejection of claim 1 be withdrawn.

Claim 11 was also grouped under the same rejection as claim 1, although with respect to claim 11 in particular, the Examiner added that "standard operating serialization circuits would arrange the signals in a queue." Regardless, Applicant reiterates that there is no motivation to combine Schutz with Schneider et al. because any such combination is unworkable and could not result in the claimed invention. Even if combined, these references do not teach each and every element of claim 11. The Examiner has acknowledged that Schneider et al. does not teach serial communication, and Schutz merely teaches communication from a monitoring apparatus to an external computer. Neither Schneider et al. nor Schutz teaches a plurality of sensors disposed in a plasma torch.

The Examiner characterized the text found at column 4, lines 48-64, of Schneider et al. as "mention[ing] that feedback may be provided from the torch 106 and may include voltage,

current, functions thereof, trigger signal, and the like." From this, the Examiner concluded that "a voltage or current feedback signal indicates the presence of a sensor."

Applicant disagrees. It is true that voltage and current may be "sensed" by "sensors," but voltage and current are not characteristics which must be "sensed" in order to be feedback. In circuit design, voltage and current feedback loops and feedback signals are commonly used, such as in op amp-based filter circuits for example. There is no "sensor" in such a circuit, yet a feedback signal comprising voltage and current is conducted. Conductive wires do not "sense" voltage or current, they simply convey these electrical characteristics. As such, a feedback signal does not automatically imply a sensor, let alone one that is disposed inside a plasma torch. Additionally, voltage and current can be conducted along leads away from a torch to be "sensed" elsewhere. Therefore, Schneider et al. merely suggests that feedback signals may be conveyed, but does not teach that sensors are used at any particular place. Schneider et al. does not teach or suggest that which is presently claimed.

Schutz also does not teach the claimed sensors. The only sensors taught by Schutz are disposed outside the thermal coating apparatus 17, in the monitoring apparatus 1. *See* sensors 3a in Fig. 1. As discussed above, the monitoring apparatus is not incorporated in, or part of, a plasma torch. Accordingly, since there is no motivation to combine these references, and since these references do not teach each and every element of claim 11, Applicant respectfully requests that the rejection of claim 11 and all claims depending therefrom be withdrawn.

With regard to claim 15, the Examiner used the same rejection as applied to claims 1 and 11. As with claims 1 and 11, Applicant reiterates herein that there is no motivation to combine Schneider et al. with Schutz and any combination thereof is unworkable, as previously set forth. Furthermore, these two references regard distinct systems adapted for dissimilar processes. And, even if combined, these references do not teach sensors or a serializer disposed in a torch body, as called for in claim 15.

Applicant has already described above that the monitoring apparatus 1 is not part of the thermal coating apparatus 17 of Schutz. Since both the sensors 3a and the corresponding serial port 26 are located within the housing 2 of the monitoring apparatus 1, these components cannot be said to be located in a plasma torch body, or even within the body of thermal coating apparatus 17. Serial port 26 is part of circuitry block 8, which is disposed within the housing 2 of monitoring apparatus 1, and sensors 3a are clearly shown in Fig. 1 as being located in monitoring apparatus 1. *See* Figs. 1, 2; col. 4, lns. 48-56. Therefore, even if Schutz is combined with Schneider et al., the combination still would not teach or suggest each and every limitation of

claim 15. As such, Applicant respectfully requests withdrawal of the rejections to claim 15 and those claims depending therefrom.

Claim 19 was also rejected under the same group rejection as claims 1, 11, and 15. Applicant again reiterates the lack of motivation to combine Schneider et al. with Schutz, and that even if the combination were to be made, neither Schneider et al. nor Schutz teaches or suggests the invention as claimed in claim 19. Specifically, Schneider et al. and Schutz do not teach or suggest the steps of "disposing a plurality of sensors within the housing to provide operational feedback regarding operational conditions of a plasma-cutting process" or "connecting the plurality of sensors to a serializing circuit such that feedback from the sensors is queued by the serializing circuit before being sent to a plasma-cutting power source." Schutz expressly teaches sensors 3a located within the housing 2 of a monitoring apparatus 1, and Schneider et al. is silent as to where and whether sensors are even used. Furthermore, the Examiner admitted that Schneider et al. does not teach serial communication, and Applicant has shown above that Schutz does not teach feedback between a power source and a torch. As such, Applicant respectfully requests that the rejection of claim 19, and the rejections of all claims depending therefrom, be withdrawn.

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 1-22.

Applicant appreciates the Examiner's consideration of these Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,

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Dated: July 7, 2005
Attorney Docket No.: ITW7510.062

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